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AIR QUALITY IN ONTARIO

1993

An Overview

A review of the State
of Air Quality by the
Ministry of Environment
and Energy

Ontario

ONTARIO'S AIR QUALITY, 1993: AN OVERVIEW

This publication provides the reader with an overview of Ontario's air quality. For a more detailed and comprehensive analysis please see the technical document: *Air Quality in Ontario - 1993* (ISSN 0840-9366 Vols. 1 and 2). It may be purchased at Publications Ontario, 50 Grosvenor St., Toronto, Ontario, M7A 1N8 or call 416-326-5300 or 1-800-668-9938 (toll free).

ACKNOWLEDGEMENT

This publication has been prepared by the staff of the air quality and meteorology section of the Environmental Monitoring and Reporting Branch, Ontario Ministry of Environment and Energy, with contributions by the staff of the regional offices of the Operations Division, Laboratory Services Branch and the atmospheric studies section of the Science and Technology Branch, Ministry of Environment and Energy. Air quality data from Environment Canada's National Air Pollutant Surveillance Program monitoring sites in Ontario are also included. MOEE's Public Affairs and Communications Branch helped with plain language editing and design.

Overview

Air pollution is a problem and concern for many people in Ontario. It can affect human and animal health, damage vegetation and property, and cause other problems. Most pollutants found in Ontario's air come from industrial production, automobiles and the furnaces which heat our homes and workplaces. Some air pollution is generated locally and some crosses the border from the United States. Since 1971, the Ministry of Environment and Energy has been monitoring air quality in Ontario and using this data to develop programs and policies to deal with air quality problems.

SIGNIFICANT REDUCTIONS; SOME CONCERNS

The pollutants tracked by Ontario's air monitoring program include: carbon monoxide, oxides of nitrogen, sulphur dioxide, ozone, volatile organic compounds, total suspended particulates, lead, manganese, total reduced sulphur compounds, and toxic organics. Table 1 shows the relationship between the air pollutants monitored and current air concerns.

Ministry programs and policies have led to significant reductions in air concentrations of many of these contaminants. Since 1971 there has been an 83 per cent reduction in sulphur dioxide, 99 per cent in lead, 79 per cent in carbon monoxide and 60 per cent in particulates. Since 1975, nitrogen dioxide concentrations have decreased by 22 per cent and oxides of nitrogen by 44 per cent.

In spite of these reductions, ground-level ozone (smog) and particulate concentrations continue to exceed Ontario's air quality criteria in some areas of southern Ontario. Ground-level ozone is a difficult substance to control as it is not emitted directly into the air in large quantities. Rather, it is produced by the chemical reaction of oxides of nitrogen and hydrocarbons in the presence of sunlight. Oxides of nitrogen are predominantly emitted by cars, trucks and other combustion engines such as industrial boilers. Hydrocarbons, on the other hand, are generated not only by human activity but are also naturally emitted by trees and vegetation. In addition, significant amounts of ozone in Ontario — more than 50 per cent on hot summer days — and its precursors (oxides of nitrogen and hydrocarbons) come from U.S. sources.

Ontario has several programs to reduce ground-level ozone and particulates: the Federal-Provincial NO_x-VOC Management Plan, the Federal-Provincial Air Quality Advisory, the Gasoline Volatility Regulation, the Stage 1 Vapour Recovery Regulation, the Dry Cleaners Education Regulation and the Vehicle Inspection and Maintenance Pilot Program. In addition, there are specific limits on numerous, individual industrial sources.

TWO KINDS OF TRACKING

The ministry tracks two kinds of trends in air quality: concentrations and emissions. Air concentrations are the actual amounts of pollutants, per volume of outdoor air, measured at selected sites across the province. Emissions are estimates of the total amounts of pollutants released into the air annually (from various sources), based upon the best available engineering calculations. Generally, if emissions decrease, so do the concentrations. However, this is not always the case. For instance, although *emissions* of pollutants which contribute to the formation of ground-level ozone have actually decreased, ground-level ozone *concentrations* have continued to increase. This is partly due to the weather and a phenomenon called long range transport. Simply put, some contaminants can travel over long distances and affect populations far from the source. In the case of ground-level ozone, more than 50 per cent of the problem is imported by prevailing winds from the midwestern United States.

In 1993, the Ontario Ministry of Environment and Energy, in cooperation with Environment Canada, instituted a program to issue air quality advisories. These are issued in anticipation of periods of elevated ground-level ozone concentrations and urge people to take pollution-reducing action, such as driving less, not using gas powered mowers, etc. Only one such advisory was issued in 1993.

The province also has a monitoring program to measure a select group of toxic organic compounds in urban areas. Results show that outdoor air concentrations of these compounds are generally low and compare favourably with similar urban locations in the U.S.

Compared to Vancouver, Montreal and 12 other major cities around the world, Toronto’s air quality (in 1993) was near the middle of the range. Nitrogen dioxide, carbon monoxide and ground-level ozone levels were slightly above; while sulphur dioxide, total suspended particulates and inhalable particulates levels were below the middle of the range.

Ontario’s air quality has improved significantly as a result of various abatement programs. For example, in Schreiber (northern Ontario), there were many off-property dust complaints after a new ore concentrate transfer site started operations. In 1992, after talking to the MOEE, the company introduced a system which reduced dust coming from the site. In another case, the ministry used sophisticated scientific models to convince IVACO Rolling Mills (L’Original, eastern Ontario) that their fume control system wasn’t operating as efficiently as it could. Even though their emissions were within the 24-hour criterion for suspended particulate, there was a long history of complaints about visible emissions, soiling and other problems. In 1993, the fume control system was upgraded and monitoring showed improved air quality.

In other cases, the emissions of various pollutants from steel mills in Hamilton, metal plants in Toronto, nickel smelters in Sudbury and pulp mills in Dryden and Fort Frances have all decreased. This is due to actions taken by companies in response to specific control orders issued by the ministry.

Some problems remain for ground-level ozone, inhalable particulates and total reduced sulphur compounds. New abatement programs have been introduced to reduce oxides of nitrogen and hydrocarbons, the precursors of ground-level ozone. In conjunction with pollution prevention activities and negotiations with the U.S., these measures are expected to reduce ozone and particulate levels in the future.

This publication provides a snapshot of the data collected for these substances in 1993.

TABLE 1

Linkages Between Air Pollutants and Air Concerns

		AIR CONCERNS					
		Ground-Level Ozone	Global Warming	Urban Air Quality	Acid Deposition (Acid Rain)	Health	Aesthetics (smell and visibility)
POLLUTANTS	Carbon Monoxide			✖		✖	
	Oxides of Nitrogen	✖	✖	✖	✖	✖	✖
	Sulphur Dioxide		✖	✖	✖	✖	✖
	Ozone	✖	✖	✖		✖	
	Volatile Organic Compounds	✖	✖	✖		✖	
	Total Suspended Particulates		✖	✖	✖	✖	✖
	Lead			✖		✖	
	Manganese			✖		✖	
	Total Reduced Sulphur Compounds			✖			✖
	Toxic Organics			✖		✖	

CO Carbon Monoxide

CONCENTRATIONS
1984-93: 12 per cent decrease
1992-93: Stable (no change)

EMISSIONS:
1985-93: 11 per cent decrease
1992-93: 2 per cent decrease

ONTARIO AMBIENT AIR QUALITY CRITERIA (AAQC):
1 hour 30 parts per million (ppm)
8 hour 13 parts per million

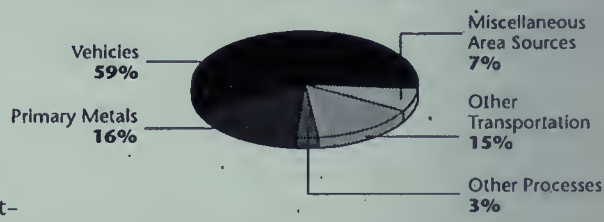
Effects Carbon monoxide enters the blood stream and reduces the delivery of oxygen to the organs and tissues of the body. The health threat of high concentrations of CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected but only at higher concentrations. Exposure to elevated levels is associated with impairment of visual perception, work capacity, learning ability, manual dexterity and performance of complex tasks.

Trends Since 1971, carbon monoxide concentrations have decreased 79 per cent. Estimates of CO emissions from 1985 show little change in total emissions until 1988: There has been a slow, steady decrease since that year, mostly due to stricter vehicle emission standards for new cars.

Average reductions of concentrations of CO over the past two decades are the result of abatement activities (i.e., various provincial air pollution regulations and policies, including regulations for tighter emission controls of vehicular sources).

The one-hour and eight-hour Ontario Ambient Air Quality Criteria (AAQC) for CO have not been exceeded in the last two years. MOEE's monitoring site at Gerrard and Yonge streets, in downtown Toronto, continues to record the highest one-hour and eight-hour maximum values of all monitoring sites in the province. This is directly related to vehicle emissions of CO in an urban canyon setting.

Ontario Carbon Monoxide Emissions by Sectors
(Emissions from Human Activities, Early 1990s)



The transportation sector accounts for about 75 per cent of all CO emissions. Despite an increase in vehicle kilometres travelled each year, CO emissions from the transportation sector have decreased by about 20 per cent since 1985.

FIGURE 1 10-Year Trend for CO

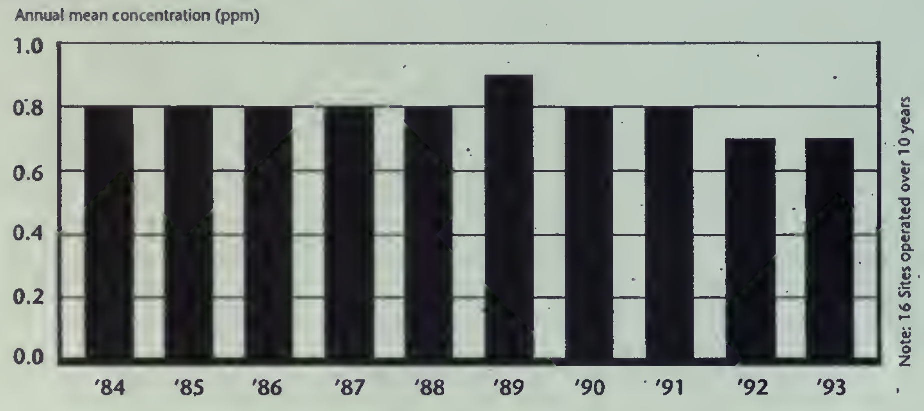
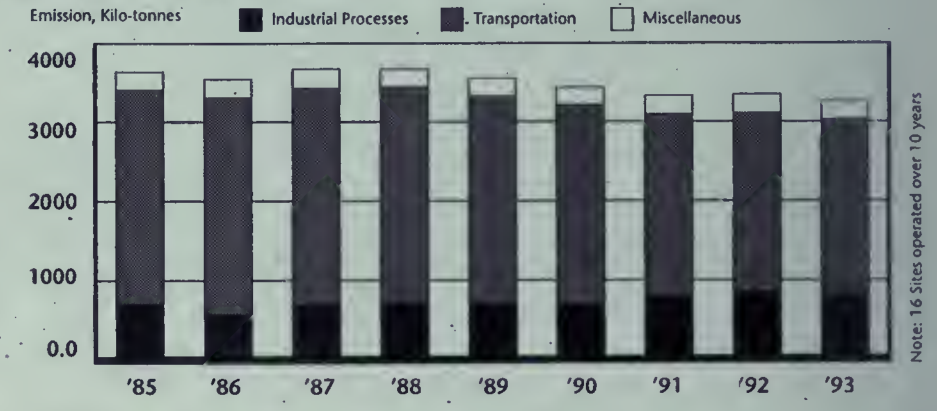


FIGURE 2 Ontario Carbon Monoxide Emission Trend (1985 to 1993)



NO_2 Nitrogen Dioxide

A component of oxides of nitrogen (NO_x)

AIR CONCENTRATIONS

1984-93: Approximately 10 per cent decrease

1992-93: Stable (no change)

EMISSIONS: OXIDES OF NITROGEN (NO_x)

1985-93: Approximately 14 per cent decrease

1992-93: Approximately 8 per cent decrease

ONTARIO AMBIENT AIR QUALITY CRITERIA (AAQC): NITROGEN DIOXIDE

1 hour	*0.20 parts per million (ppm)*
24 hour	*0.10 parts per million*

Effects Nitrogen dioxide can irritate the lungs and lower resistance to respiratory infection. It also has an adverse effect on materials (i.e., corrosion of metals, fading of fabric dyes, degradation of rubber, etc.) and on vegetation.

Nitrogen dioxide causes ground-level ozone to form through chemical reactions with hydrocarbons in the presence of sunlight. Oxides of nitrogen (NO_x) emissions are also linked to the formation of acid rain.

Trends Undesirable air quality (when the maximum concentration exceeded the Ontario criterion) due to NO_2 was measured in Windsor for six hours in 1993. There were no observed exceedances of NO_2 at other monitoring sites in Ontario.

Approximately 60 per cent of NO_x are emitted by the transportation sector. A major part of the remaining 40 per cent comes from power generation, primary metal producers and other industries.

Ontario Nitrogen Oxides Emissions by Sector

(Emissions from Human Activities, Early 1990s)

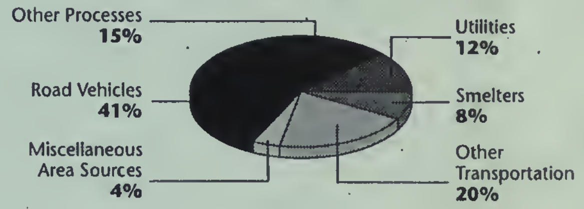


FIGURE 3 10-Year Trend for NO_2

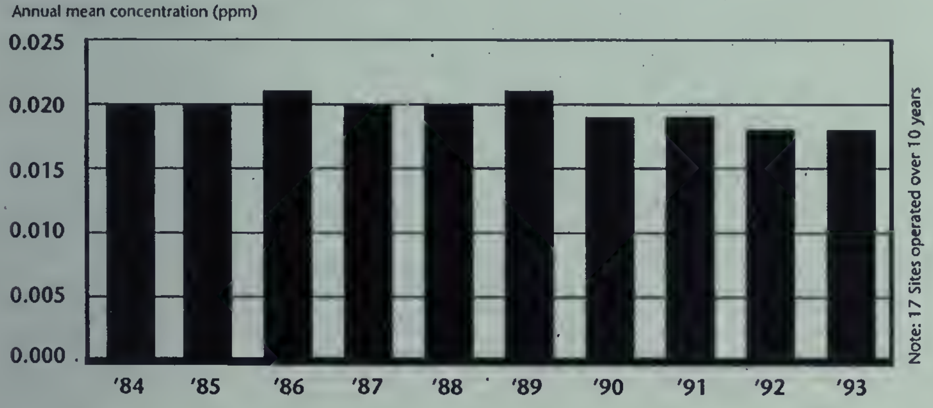
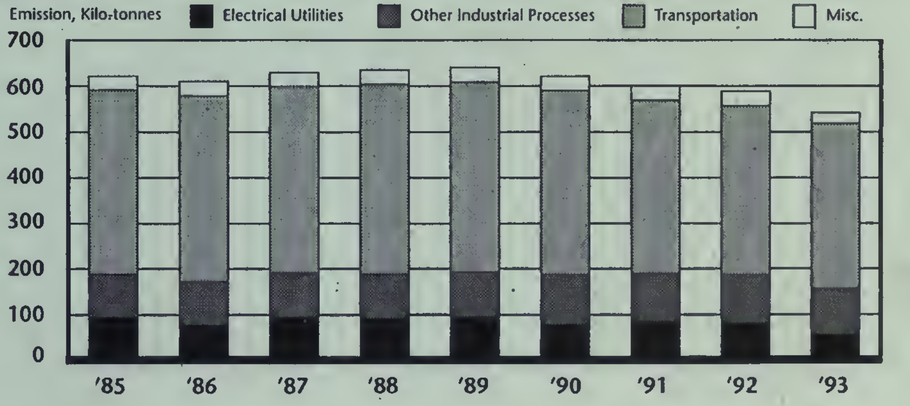


FIGURE 4 Ontario Nitrogen Oxides (NO_x) Emission Trend (1985 to 1993)



SO_2 Sulphur Dioxide

AIR CONCENTRATIONS
1984-93: Approximately 33 per cent decrease
1992-93: Stable (no change)

EMISSIONS:
1984-93: 48 per cent decrease
1992-93: 12 per cent decrease

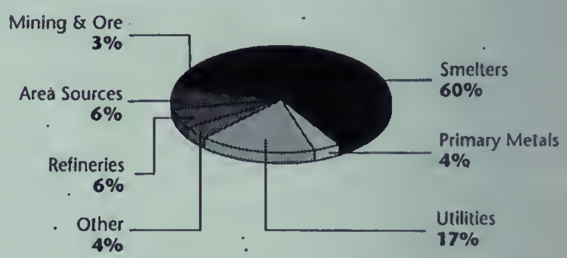
ONTARIO AMBIENT AIR QUALITY CRITERIA (AAQC):
1 hour 0.25 parts per million (ppm)
24 hour 0.10 parts per million
1 year 0.02 parts per million

Effects Health effects associated with exposure to high concentrations of sulphur dioxide (SO_2) include breathing discomfort, respiratory illness, alterations in the lungs' defenses and aggravation of existing respiratory and cardiovascular disease. People with asthma, chronic lung disease or heart disease are the most sensitive to SO_2. It also damages leaves on trees and agricultural crops. Sulphur dioxide (along with NO_x) contributes to acid rain, which has a number of environmental effects including lake acidification, corrosion and haze. Sulphur dioxide also contributes to the formation of acid aerosols, which are a factor in global warming.

Trends There has been a significant decrease (83 per cent) in average levels of sulphur dioxide over the last 23 years. Emission levels decreased 76 per cent over the same period.

Under the Canadian Acid Rain Control Program, Ontario was to reduce its total SO_2 emissions to 885 kilotonnes by 1994, a reduction of 60 per cent of its 1980 base level. However, 1993 total SO_2 emissions (820KT) is already within the goal set for 1994. In Ontario, approximately 80 per cent of SO_2 emissions come from four corporate sources: INCO, Falconbridge, Algoma Steel and Ontario Hydro. Provincial regulations require these companies to reduce their 1980 base emissions by 65 per cent by 1994.

Ontario Sulphur Dioxide Emissions by Sectors
(Emissions from Human Activities, Early 1990s)



Undesirable air quality due to SO_2 was measured on a number of occasions in 1993. Levels exceeding the one-hour Ontario criterion for SO_2 were recorded at 14 out of 60 monitoring locations (23 per cent). Of these 14 stations, 13 were in the Sudbury basin area. The 24-hour criterion for SO_2 was exceeded at one site, also in Sudbury.

FIGURE 5 Long Term Trend for SO_2

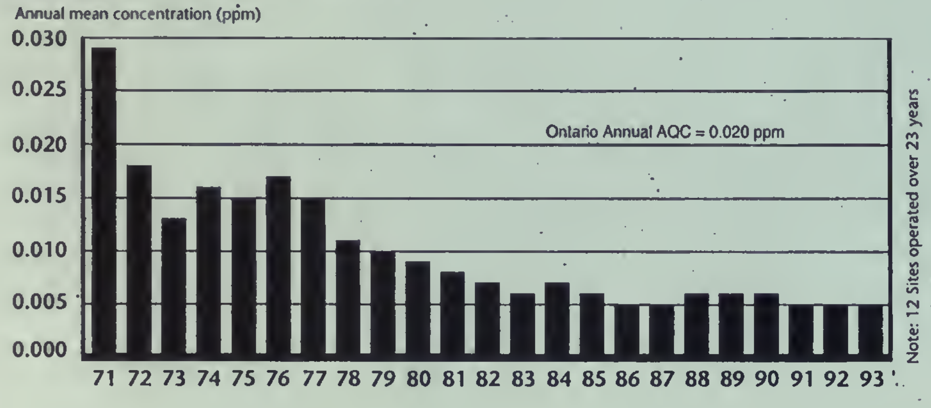
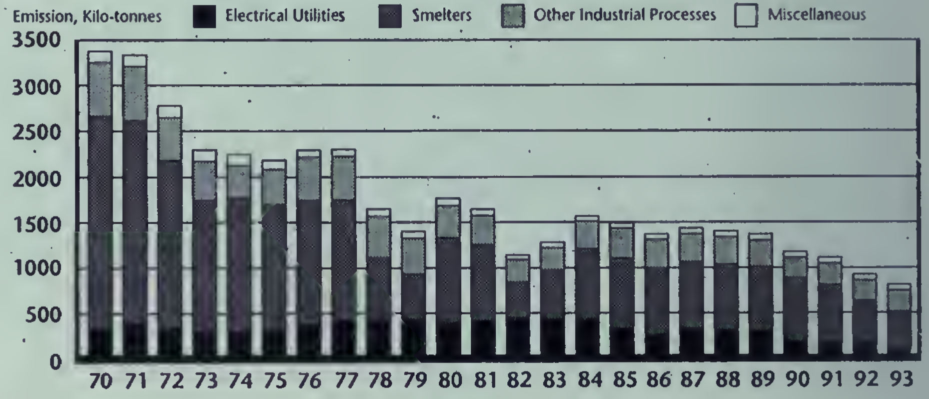


FIGURE 6 Ontario Sulphur Dioxide Emission Trend (1970 to 1993)



O_3

Ground-Level Ozone

AIR CONCENTRATIONS

1984-93: 2 per cent increase

1992-93: 5 per cent increase

PRECURSOR EMISSIONS: OXIDES OF NITROGEN (NO_x) AND VOLATILE ORGANIC COMPOUNDS (VOCs)

1985-93: 14 per cent decrease in NO_x, 7 per cent decrease in VOC

1992-93: 8 per cent decrease in NO_x, 4 per cent decrease in VOC

ONTARIO AMBIENT AIR QUALITY CRITERIA (AAQC): OZONE

1 hour 80 parts per billion (ppb)

Effects Ground-level ozone irritates the lungs and can make breathing difficult. Exposure to high concentrations of ozone results in chest tightness, coughing and wheezing. Ozone is responsible each year for agricultural crop loss in Ontario and causes noticeable leaf damage in many crops and tree species.

Trends Ground-level ozone, a contributor to smog, is the one contaminant which exceeds the provincial air quality criterion most frequently. In 1993, the one-hour criterion was exceeded at 37 out of 46 ozone stations. There were 12 ozone "episode days" in 1993, which is significantly less than the maximum of 36 days in 1988, but greater than the minimum of 7 in 1982. The highest measured one-hour value at ground level in 1993 (139 ppb) was recorded at Grand Bend, in southwestern Ontario.

Little change is apparent in the annual average ground-level ozone concentrations. This is because year-to-year ozone levels are strongly influenced by the weather and neighbouring U.S. emission sources upwind.

As part of its approach to control smog, Ontario has introduced a number of initiatives to reduce ozone precursor emissions, such as:

- a regulation which restricts the volatility of gasoline during the summer months;
- regulations to minimize NO_x and VOCs emissions from stationary turbine engines, dry cleaning operations and the transfer of gasoline;

FIGURE 7 10-Year Trend for Ozone

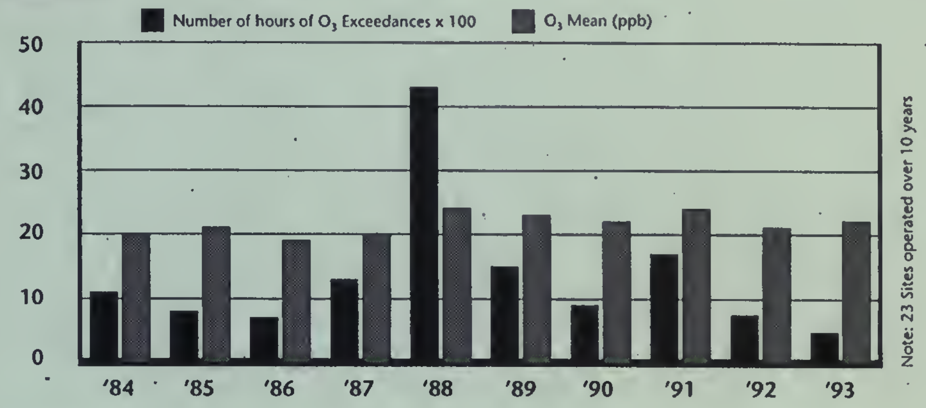


FIGURE 8 Ontario Nitrogen Oxides Emission Trend (1985 to 1993)

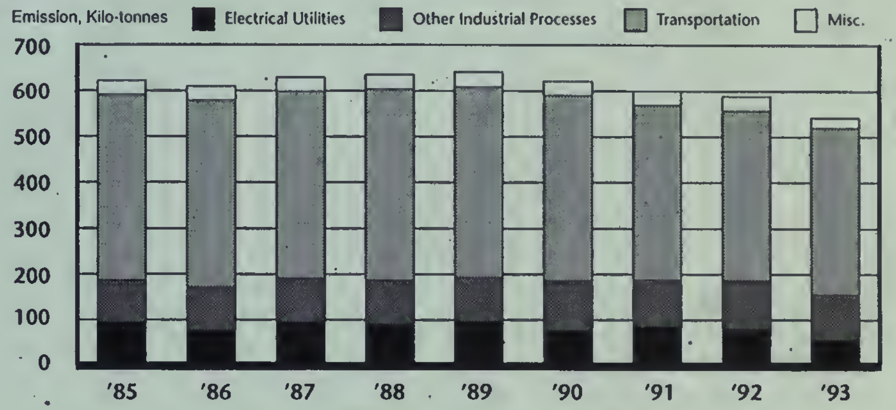
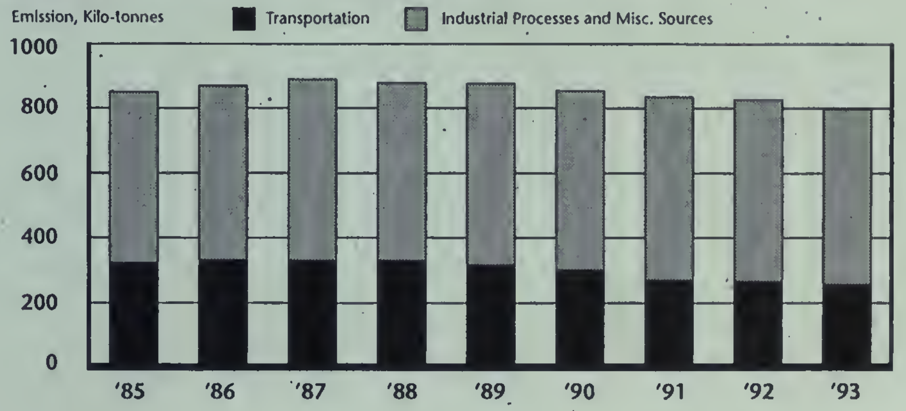


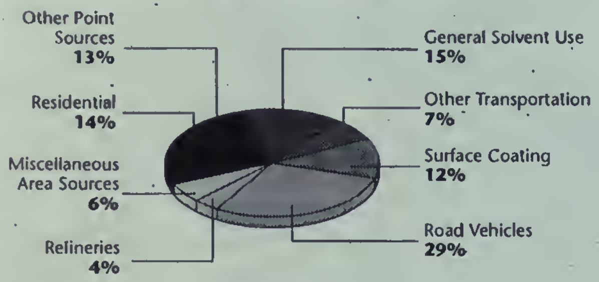
FIGURE 9 Ontario VOC Emission Trend (1985 to 1993)



- a voluntary vehicle inspection and maintenance pilot program to reduce vehicle emissions;
- an Ontario Hydro commitment to reduce 1985 NO_x emissions by at least 40 per cent by the year 2000.

In addition, initiatives such as the Federal-Provincial NO_x-VOC Management Plan and the Federal-Provincial Air Quality Advisory are in place to reduce Ontario's ozone precursor emission sources.

Ontario VOC Emissions by Sectors
(Emissions from Human Activities, Early 1990s)



TSP Total Suspended Particulates

AIR CONCENTRATIONS
1984-93: 25 per cent decrease
1992-93: Stable (no change)

EMISSIONS:
1985-93: 4 per cent increase
1992-93: 2 per cent decrease

ONTARIO AMBIENT AIR QUALITY CRITERIA (AAQC):
24 hour 120 micrograms per cubic metre (ig/m^3)
1 year 60 micrograms per cubic metre

Effects Particles less than 10 microns in diameter (also called inhalable particulates, or PM-10) can penetrate deep into the lungs and contribute to respiratory disease. Corrosion, soiling of materials, damage to vegetation and visibility reduction are additional effects of suspended particulates.

Trends Total suspended particulates (TSP) concentrations in air decreased significantly between 1989 and 1992 and 1992 levels were maintained in 1993.

Particulate emissions are evenly distributed between transportation (23 per cent), and area fuel combustion (22 per cent). Utilities produce only 4 per cent of particulate emissions. Primary metals (10 per cent), pulp and paper (11 per cent) and other manufacturing and mining sectors contribute to the rest of the emissions.

The annual and the 24-hour criteria for suspended particulates continue to be exceeded in some areas of the province, primarily in large urban centres.

Ontario Particulate Emissions by Sectors
(Emissions from Human Activities, Early 1990s)

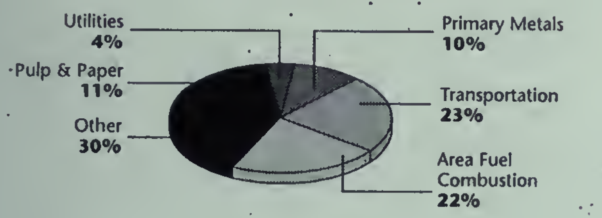


FIGURE 10 10-Year Trend for TSP

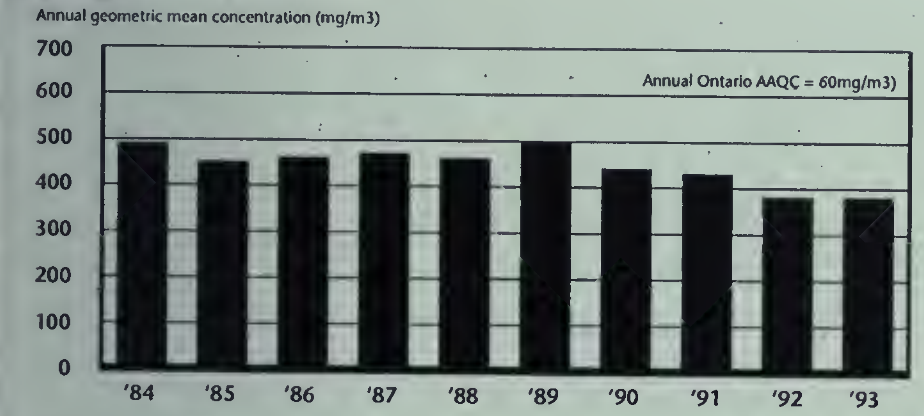
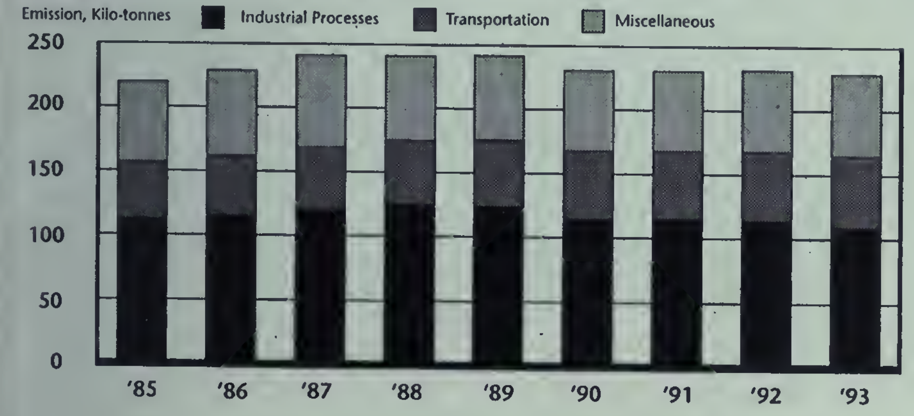


FIGURE 11 Ontario Particulate Emission Trend (1985 to 1993)



Pb Lead

AIR CONCENTRATIONS

1984-93: 96 per cent decrease
1992-93: Stable (no change)

ONTARIO AMBIENT AIR QUALITY CRITERIA (AAQC):

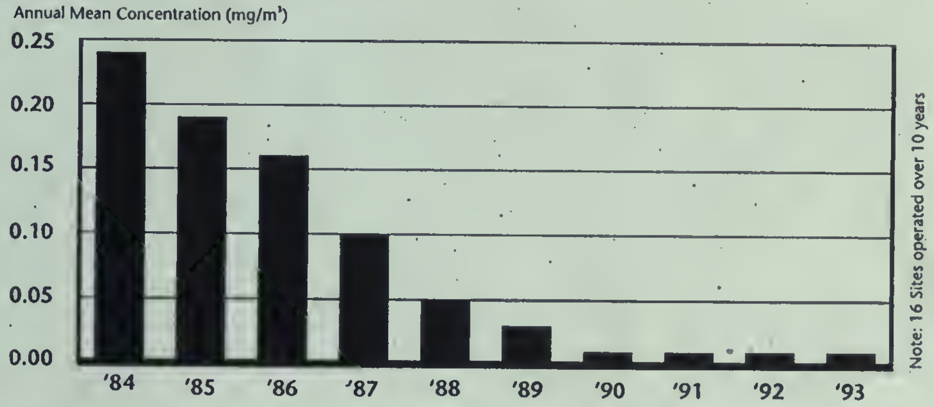
24 hour 5.0 micrograms per cubic metre (ig/m^3)
30 day 2.0 micrograms per cubic metre

Effects Exposure to lead adversely affects human health. Lead can degrade kidney function, impair haemoglobin synthesis and affect the nervous system.

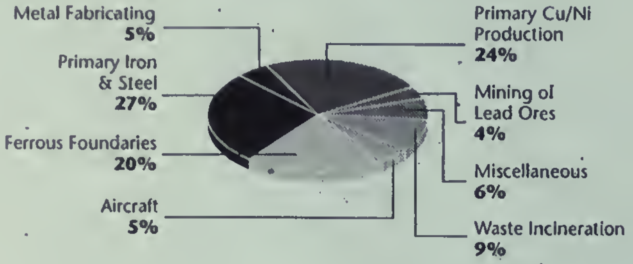
Trends Decreases in lead emissions are primarily due to the increased use of unleaded gasoline in automobiles and the reduced lead content in leaded gasoline. Lead emissions from gasoline use have been effectively eliminated because the addition of lead to gasoline was prohibited after December 1, 1990.

Since the ban, almost four-fifths of Ontario's lead emissions are from mining and metal smelting operations. As a result, the highest levels in the province are now measured near secondary lead smelters in Toronto and Mississauga. Emissions from these plants are being closely monitored to ensure they do not exceed Ontario's AAQC.

FIGURE 12 10-Year Trend for Pb in TSP



Ontario Lead Emissions by Sectors
(Emissions from Human Activities, Late 1980s)



Mn Manganese

Air Concentrations

1984-90: 48 per cent increase

1990-91: 24 per cent decrease

1991-93: 5 per cent increase

Ontario Ambient Air Quality Criteria (AAQC):

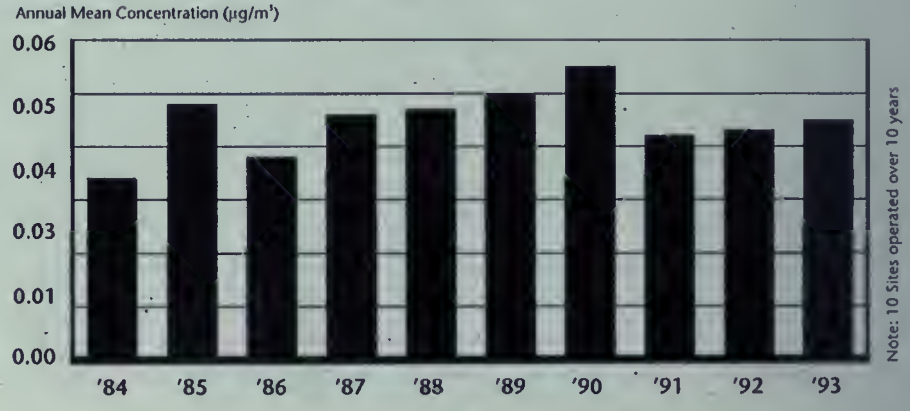
24 hour 2.5 micrograms per cubic metre (ìg/m^3)

Effects Exposure to high levels of manganese dust can cause a syndrome known as manganism, which is marked by mental and emotional disturbances, slowness and clumsiness of movement.

Trends Manganese concentrations have not exceeded the Ontario 24-hour AAQC for the last two years. In the past, exceedances of the manganese criterion have been recorded at monitoring sites adjacent to iron and steel-making facilities in Sault Ste Marie and Hamilton.

Manganese, an additive to unleaded gasoline (in Canada), is also emitted from iron and steel industries and transported over long distances by air currents.

FIGURE 13 10-Year Trend for Mn in TSP



TRS Total Reduced Sulphur Compounds

Air Concentrations

1984-93: 12 per cent decrease

1992-93: Stable (no change)

Ontario Ambient Air Quality Criteria (AAQC): (from kraft pulp mills)

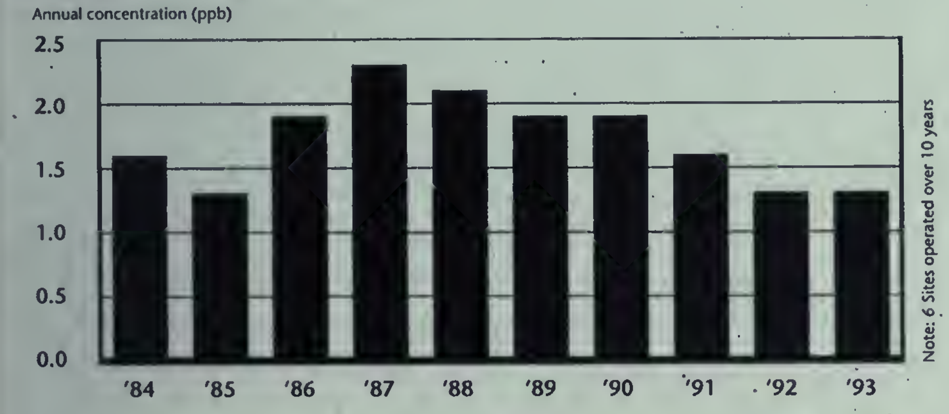
1 hour 27 parts per billion (ppb)

Effects Total reduced sulphur compounds are not normally considered a health hazard, however, they are the primary cause of odours (rotten egg smell).

Trends Province-wide averages of total reduced sulphur compounds reached their maximum in 1987 and have been steadily decreasing since then.

As expected, the highest numbers of exceedances of the one-hour kraft pulp mill criterion were recorded in communities that have kraft pulp mills, (ie., Fort Frances, Cornwall, Terrace Bay, Thunder Bay, Red Rock and Marathon). On occasion, elevated levels of TRS were also recorded in Windsor, Hamilton, Oakville and Sault Ste Marie. Elevated levels of TRS in these locations are usually due to iron and steel, or refinery operations.

FIGURE 14 10-Year Trend for TRS



VOCs Toxic Organic Chemicals

Air Concentrations

1989-1993: - slightly variable (year-to-year/site to site) for volatile organic compounds (VOCs)

1989-1993: - slightly variable (year-to-year/site to site) for dioxins and furans (PCDD/PCDF)

1989-1993: - highly variable (year-to-year/site to site) for benzo[a]pyrene (B[a]P)

Effects Airborne toxic organic chemicals are generally known to be carcinogenic (cancer forming) or suspected of being carcinogenic.

Trends These toxic organics have not been monitored long enough to determine trends in ambient concentrations. Inability to determine a trend is also due to among other things, gasoline formulation, age and composition of Ontario's cars, trucks and buses, and vehicle kilometres travelled. Also, as economic cycles fluctuate, so do emissions of airborne toxic organic chemicals.

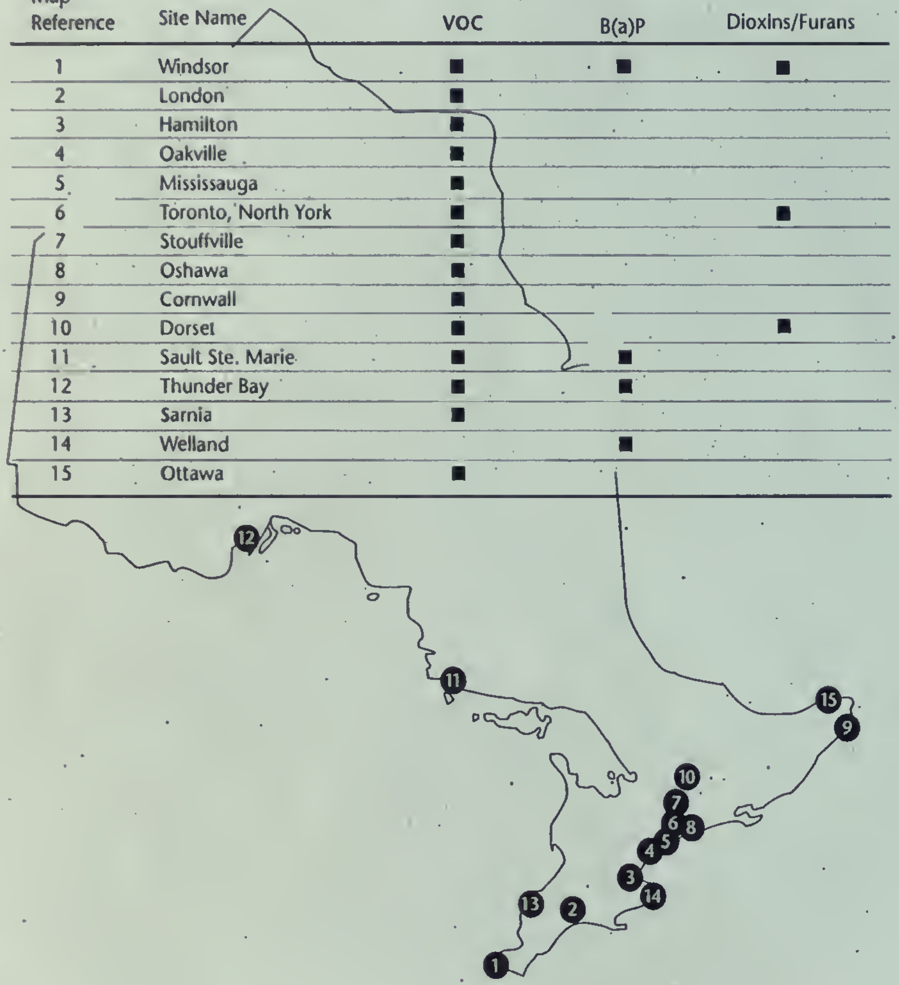
Undesirable air quality due to volatile organic compounds (VOCs) is rarely recorded in the province. The 24-hour AAQC for vinyl chloride (1 $\mu g/m^3$) was exceeded only once, in Sarnia, in 1991 (1.4 $\mu g/m^3$). The annual AAQC (0.2 $\mu g/m^3$) has not been exceeded. The situation is similar for ethylene dibromide: only one exceedance of the 24-hour AAQC (3.1 μ/m_3) in 1991, in Hamilton.

Undesirable air quality due to dioxins and furans has not been recorded in the province.

Undesirable air quality due to the polynuclear aromatic hydrocarbon (PAH) benzo[a]pyrene, has been recorded in several locations between 1989 and 1992. At sites close to known sources, B[a]P concentrations can exceed the AAQC by as much as 160 times. At typical urban sites, the annual average does not exceed the AAQC.

FIGURE 15 Location of Toxic Organic Chemicals Monitoring Sites

Map Reference	Site Name	VOC	B(a)P	Dioxins/Furans
1	Windsor	■	■	■
2	London	■		
3	Hamilton	■		
4	Oakville	■		
5	Mississauga	■		
6	Toronto, North York	■		■
7	Stouffville	■		
8	Oshawa	■		
9	Cornwall	■		
10	Dorset	■		■
11	Sault Ste. Marie	■	■	
12	Thunder Bay	■	■	
13	Sarnia	■		
14	Welland		■	
15	Ottawa	■		



Air Quality Indices, Advisory and Alert

Air Pollution Index (API)

The Air Pollution Index (API), derived from a combination of sulphur dioxide and suspended particles, is the basis of the alert system for air pollution in Ontario. The advisory level of 32 was reached three times in 1993. In 1993, the highest API, 37, was recorded in Hamilton and was dominated by suspended particles. Only Hamilton has experienced levels in the advisory range in the past three years. Recorded API episodes have continuously declined since 1971.

Air Quality Index (AQI)

The Air Quality Index (AQI) provides the public with a report of the air quality at 33 sites in 26 cities across Ontario. Automatic air monitoring stations sample the outdoor air 24-hours a day, 7 days a week and the MOEE shares this information with the media. The AQI reports on six of the most common urban air pollutants: carbon monoxide, nitrogen dioxide, ozone, sulphur dioxide, suspended particulates, total reduced sulphur compounds and a combination of SO_2 and SP (as measured by the API).

Results for 1993 show that moderate to poor air quality was recorded for at least one-hour at all AQI sites. Elevated levels of ozone and suspended particles were the most frequent cause of high index readings at most AQI sites. At monitoring stations close to kraft pulp mills, total reduced sulphur compounds were the cause of high AQI levels.

Air Quality Advisory

In Ontario, Environment Canada and the Ontario Ministry of the Environment and Energy jointly issue air quality advisories to the public when widespread elevated air pollution levels are forecast due to ground-level ozone. The advisories, introduced in 1993, build on the existing Air Quality Index system and cover southern Ontario (this program was extended to Sudbury and North Bay in 1994). During the advisory, people are encouraged to practice pollution prevention and "Spare the Air". One advisory was issued on August 27, 1993.

Lambton Industry Meteorological Alert (LIMA)

The Lambton Industry Meteorological Alert was issued on seven occasions in 1993. LIMA is an early warning system established to prevent exceedances of the Ontario 24-hour criterion for sulphur dioxide of 100 parts per billion. The longest alert was 50 hours and occurred on March 27 to 29. The area affected by this alert is a section of Lambton County (including Sarnia) in southwestern Ontario.

FIGURE 16 Number of Days with Moderate/ Poor Air Quality in Ontario 1993

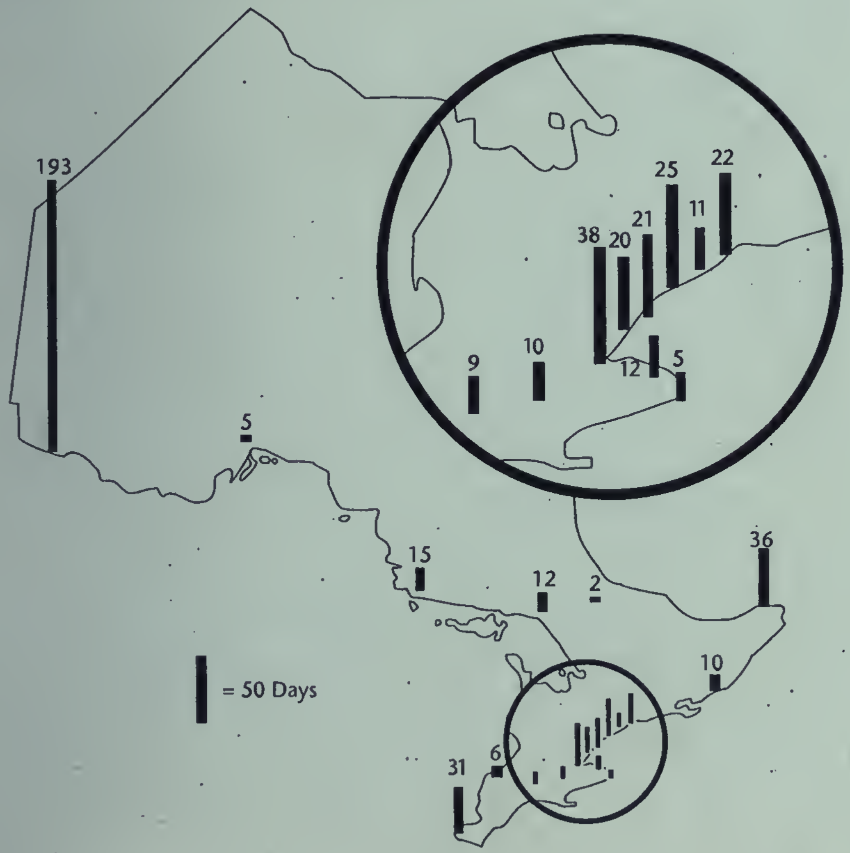
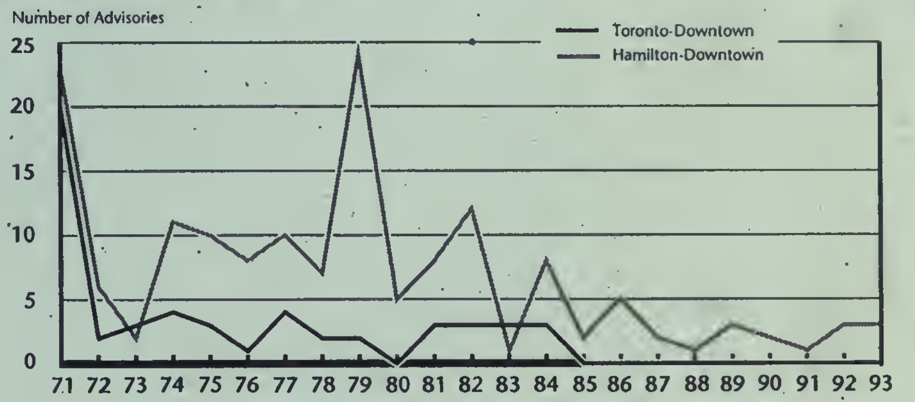


FIGURE 17 Number of API Advisories Recorded at Toronto and Hamilton (1971 to 1993)



Glossary

Abatement – activities to clean up, control or eliminate pollution

Ambient air – outdoor air

Ambient air quality criteria (AAQC) – the maximum ambient air concentration or level before there are effects on human health or vegetation; can be measured as a one-hour, eight-hour, 24-hour or one year concentration.

Concentrations – a direct measure of the actual amount of a pollutant per volume of ambient air

Emissions – estimates of the total amount of pollutants released into the air annually, based upon the best available engineering calculations

Episode days – days on which high ozone levels (greater than the one-hour AAQC concentration of 80 ppb) are measured simultaneously at monitoring sites in a widespread area (over hundreds of square kilometres)

Exceedance(s) – when the ambient air concentration goes over the one-hour, eight-hour, 24-hour AAQC

Ground-level ozone – primarily formed when hydrocarbons and oxides of nitrogen react with sunlight. Part of what is called smog

Haze – a combination of pollutants (including SO_2 and fine particulates) which make the air look brown or grey

Monitoring sites – places where the MOEE or Environment Canada have ambient air monitoring equipment

One-hour (eight, 24-hour) criterion – levels set by the MOEE for certain periods of time

Precursor emissions – substances which, when combined at the same time, under the right conditions, produce an effect (such as smog or ground-level ozone)

Smog – the colloquial term for photochemical air pollution. This includes ozone and other contaminants; tends to lend a brownish haze to the atmosphere.

Undesirable air quality – ambient air which has concentrations of contaminants that exceed AAQC levels

Queries relating to the technical information contained in this report or requests for data should be addressed to:

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